# GARDEN AND FOREST.

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## The Harlem River Speedway.

A LETTER addressed to the Mayor of New York, and published in the daily papers last week, invites attention to a state of things which one can hardly conceive of as existing in any civilized community, much less in the largest and wealthiest city in the New World. This letter was prepared by members of the Municipal Art Society—men who speak for architecture, painting and sculpture, and who represent the education and refinement of the city—and it sets forth that the Commissioners of Public Parks of this city, in the face of repeated protests, have given out contracts for the construction of a parkway extending for more than two miles along a picturesque river-front, without taking counsel of their own professional adviser or of any other man who has had any training or experience in designing works of this class. This means that the Park Board is wantonly throwing away an opportunity to make one of the most beautiful drives and promenades in the world, and has ordered engineers to build a road-bed simply; that is, they are to cut and fill and level off the ground so as to make a surface to drive over, with no more thought of providing for a pleasure-ground that shall be attractive or useful, except for a single purpose, than if they were constructing a foundation for a tramway or trolley line.

Ever since they undertook to furnish a track for light-harness driving the entire course of the Park Board has been marked by singular perversity and ignorance. They began by securing an act of the Legislature enabling them to seize a part of Central Park and turn it into a dirt road. But this proposed outrage caused such an uprising of the people here that the Legislature, the Governor and the Park Commissioners were all driven within a week to face about and abandon their plot. When the banks of the Harlem had been selected as a site for the road Mr. Vaux, the landscape-architect for the Board, provided a plan which included designs for preserving and enhancing the natural beauties of the water-front and for making them available. This plan was, however, ignored, and the Board ordered the construction of a road which was inferior even for the purpose which they had first in mind, and which did not leave even standing-room on the shore for a pedestrian, but shut off the river-front from every one who could not visit it in a road-wagon. This attempted violation of the people's rights and defiance of common decency called forth a protest from every organ of public opinion in the city; and a formal remonstrance from all societies which have to do in any way with art, was made against the abandonment of the uniform practice of the city in treating its parks as works of art. But men essentially boorish can never understand what every refined mind knows by intuition, and therefore this protest passed for nothing, and the construction of the speedway went on. Finally, an exasperated people appealed once more to the Legislature, and a special act was passed which enjoined the Board from constructing a road without a walk on the river-side. Even then contracts were given out in contempt of the law, and Mr. Paul Dana resigned his post as Commissioner because the Board was plainly and willfully violating the law. They did not desist from their law-defying course, however, until three citizens had the courage and public spirit to appear personally in the courts and make complaints that their private rights had been invaded.

Without giving any further details of this disgraceful history, it is enough to say that the Park Commissioners are still doing all they can to defeat the often expressed desire of the people. They are not only building the road without any regard to its artistic value, but they are narrowing down the walk which the law compels them to lay along the river-side, so that no adequate provision is made for shade or for accommodating the throngs who will one day gather here to witness regattas on the river and other spectacles. To the men who ask them why they do not consult their landscape-architect the Park Commissioners reply that they will invite his advice at the proper time, evidently considering it the function of this artist to make flower-beds and plant bushes in spots where he can find room for them after the road-makers have finished their digging.

Altogether, this is an unpleasant showing for a community which considers itself enlightened. No sane man would think of asking one of these Commissioners for advice as to laying out a path across a door-yard; and yet they assume to know enough to design a work like this speedway, which is worthy of all the study that a trained artist can give to it, and which might be made under skilled treatment one of the noblest and most useful public works of this city. This inability to appreciate the value of artistic training is the essence of vulgarity. It is worse than simple ignorance; it is a complacent belief that there is nothing better than ignorance. And meanwhile the people must stand by and see one of their most beautiful possessions laid waste because some prosperous brewer or seller of notions imagines that a commission from a New York Mayor qualifies him to design a park or a public building or any other work of art. Of course, such a man does not know how to meet a single one of the many problems which would confront a skilled park-maker as soon as he began any serious study of the difficulties and opportunities offered by the Harlem River front. He does not even dream that there are such problems, and scouting the protest of men like St. Gaudens, White and Chase, he blunders on. If a public enemy should set fire to the city some effort would probably be made to restrain him. But it would take a good many fires to work injury as serious and lasting as that which is now inflicted on the city by the very men who have been selected to protect its property. Every day while the construction of this speedway goes on the city suffers. Its money is misspent; its opportunities are squandered; its natural beauty is obliterated, and with it vanishes an attractiveness and charm which money cannot restore.

## The Devastation of our National Forest Reservations.

WE have frequently spoken of the necessity of specific legislation for the general management of the national forest reservations. The mere setting apart of a territory by presidential proclamation, without making any provision for the punishment of trespassers, leaves it exposed to timber-thieves, skin-hunters and marauders of all kinds. Last spring the Secretary of the Interior caused a large number of notices, conspicuously printed on cloth sheets, to be posted in various parts of the reservations, so that no one who entered could fail to see them. After stating that the reservation had been created to maintain a water-supply for irrigation and to protect the timber belonging to the people, the notices warned all persons not to settle upon or use any of the lands for agricultural, mining or other business purposes, nor to cut, remove or use any timber, grass or other natural products. The starting of a fire and driving, grazing, pasturing and herding of live stock on the reservations were also forbidden.

Not long ago Captain James Parker, superintendent of the Sequoia and General Grant National Parks, volunteered to make a tour of the parks and reservations in California. He found that not less than 500,000 sheep were pastured on this national property, and that great damage had been done by them. The herbage was all eaten, and the smaller deciduous trees were girdled. So completely were the parks and reservations devastated of everything which could be used for fodder, that it was often difficult, when away from farms and ranches where feed was stored, for Captain Parker's company to get forage for their horses. The trespassers had manifested their lawless temper by tearing down the notices which had been put up by order of Secretary Smith.

The dispatch from which we have taken the above facts goes on to say that the Secretary has sent evidences of this defiance of Government authority to the Department of Justice, and that the district attorneys and marshals in the states where the reservations are situated will be notified to prosecute offenders to the full extent of the law. The trouble is that there is no law, and there can be no law, which will be respected by the settlers who live on the borders of these reservations, until a careful study of the whole subject has been made by competent men and the proper adjustment between public and private rights has been decided upon. It will be impossible to prevent trespassing so long as there is no law to punish trespassers, and it would be quite as impossible to enforce a law which did not, to a certain degree, conform to the best public sentiment of the states in which the cases are to be tried. Altogether, this group of facts is an additional argument for an investigation of the whole subject by a competent commission and for the establishment, as soon as practicable, of a system of management for all our parks and forest reservations.

## North American Thorns.

THE interesting article in Garden and Forest for July 25th suggests a note on Cratægus apiifolia, the Parsley-leaved Hawthorn, which is among the prettiest of North American Thorns, and yet it is one that is probably rarely seen. I have a specimen on my grounds that is probably thirty years old, raised from seed which some friend, now unknown, sent to me from the vicinity of Vicksburg, before the war. It has now a trunk about the thickness of a man's arm at the elbow, with the round spreading head starting about twelve feet from the ground. The branches are extremely slender and numerous, so that the aspect is unique among Thorns. In spring it is a dense mass of white petals, with which the purplish yellow anthers make a pretty contrast. The bark peels off in the same manner as that of the Buttonwood or Plane tree. Strange to say, although we are able to propagate almost anything, no matter how difficult its multiplication is generally considered, we have almost utterly failed to increase this. Budding on any other varieties of Thorns we may have at hand has given us but few. Unfortunately, the plant is also a somewhat infertile individual, and we have only occasionally been able to get a few seeds, and even these have failed to grow. This season there seems a greater prospect of fertility than usual. It would be interesting to know whether any one else has plants in cultivation. Besides our failure above indicated, we have never been able to find any collector who could supply us with seeds since the few originally sent to us.

As to the difficulty of growing good specimens of the English Hawthorns, I apprehend that they do not object so much to our warm summer climate as they do to the heated soil. Whenever they are screened somewhat from the sun they seem to thrive pretty well. In Philadelphia, on the grounds of the Dundas estate, corner of Broad and Walnut Streets, there is a magnificent specimen of the common English Hawthorn, quite as large as we generally see in the Old World; but this is protected by a high wall on one side and the wall of the dwelling-house on the other, so that the sun rarely shines on the earth about the roots. On the north end of my own dwelling-house are specimens of the single Red and Double Red, nearly twenty feet high, which are in perfect health and free from all fungous diseases, and which make a magnificent appearance in the flowering season.

Germantown, Pa. *Thomas Meehan.*

## The Progress of Bulb Culture in North Carolina.

FEW people appreciate the fertility of much of the soil of this section, because of the remoteness of many of its best portions from general routes of travel. The black peaty soils in the counties bordering upon Pamlico, and to a great extent upon Albemarle Sound, are among the best of those which are classed as practically inexhaustible. No prairie land in the west excels in fertility the soils of Hyde and some of the adjoining counties, where, for a hundred years, the land has been in corn, and the farmers declare that they must keep it in corn or it will be as difficult and expensive to clear away the big weeds as it would to subjugate a thicket of brush-wood. All this, of course, is bad farming, for a good rotation would clean the land and make it a paradise of varied products. There is much, too, of this character of soil in all the eastern coast plains along the margins of the vast swamps, which will themselves at some time be reclaimed for farms; and intermingled with this peaty soil is much higher level sandy land of great natural capacity, but much of it badly worn by careless cultivation. The examples of the truck-growers, however, have demonstrated its wonderful productiveness.

In a small area on the Atlantic Coast Line Railroad, about Magnolia, Rose Hill and Wallace, the cultivation of Tuberoses has been largely developed of late years, and the superiority of the Tuberose-bulbs grown there is such that these places now practically supply the demand for them here and abroad. The diminished popularity of the Tuberose has largely diminished the profit of its production, though it is still carried on in large areas, and hundreds of thousands are shipped. We have shown that here at Raleigh, upon our dry upland clay soils, we can grow Roman Hyacinths larger than any of the bulbs of this variety now classed as extra in the seedsmen's catalogues; that we can bloom Gladiolus in one year from the sowing of the seed, and that from fair-sized offsets of Lilium candidum the bulbs after one winter's growth measured thirteen inches in circumference. This constant agitation—if I may use so strong a word—is beginning to arouse an interest in the matter, and a recent visit to the Tuberose growers at Wallace showed that the leaven is working well. One grower had raised last year a crop of Roman Hyacinths for a Philadelphia house, which gave great satisfaction, and he is much encouraged. Another grower has this year produced for a Chicago seedsman 75,000 Narcissus Von Sion and a large lot of Roman Hyacinths. We measured some of his bright

and solid Hyacinth-bulbs, and found them fully six inches in circumference—very large for this variety. They have as yet experimented but sparingly with Lilies, for the growth of which their soil seems to be specially adapted. We are anxious to see Bermuda Lilies well tested in these soils and this mild winter climate, and we expect that they will surpass imported bulbs in size, though not in earliness. Ascension Lilies grown here are well ripe in late June, and this matter of early ripening will be appreciated by those who understand the necessity of having time for these bulbs to make a good fall growth before forcing for winter, and of having bulbs close at hand with live roots attached. Imported bulbs of this Lily are very low in price, but we feel that the extra quality and condition of our bulbs over the imported ones will, as soon as they are known, cause them to command a better price. Years ago we were told that American-grown Tuberose-bulbs could never compete with the Italians, but we grew them, and for a while got extra prices for them, and now who buys Italian Tuberose-bulbs? One grower showed me a thousand Dutch Hyacinth-bulbs that compare very well with the Dutch product. He is utterly unskilled in the peculiar methods of developing these bulbs, but his first effort shows that if we could get here the Dutch skill we might compete with Holland even in their favorite product. But the bulb industry seems to have started in North Carolina, and it behooves our seedsmen to be on the alert.

Raleigh, N. C. *W. F. Massey.*

## Botanical Notes from Texas.—XXII.

NOTWITHSTANDING the drought, it has been a good year for Juglans rupestris. The ground under the trees of that species is nearly covered with its diminutive fruit. Mexicans call the tree Nogal and Cañon Nogal. A much-branched and leafy shrub, resinous and viscid, with a not unpleasant odor, and from three to six feet tall, and almost everywhere around Del Rio, is Flourensia cernua. At this season of the year its greenish nodding flower-clusters are mostly in fruit. It may easily be recognized by the leafy bracts of the involucres and by its very villous achenes (fruits). In a little nook on the sunny side of a dry irrigating ditch I discovered a handsome species of Hoffmannseggia, with both flowers and fine fruit—a genuine prize.

In a ledge of limestone rocks, by the side of the railway, there were several individuals of the rare and stange Macrosiphonia Berlandieri of the Indian Hemp family. This species is remarkable, as the name of its genus makes known to us, for its greatly elongated flower-tube, which is three to five inches long. They had passed flowering, but their long, slender, rounded fruit-pods were in good condition and abundant. The apical coma of the oblong seeds in this species is copious in quantity and fulvous in color. Close to San Felipe, where its roots could drink as they pleased, I saw a single individual of Eysenhardtia orthocarpa. This more western species is much taller, sometimes becoming a tree, than its congener already mentioned. It has more and larger leaflets, and larger straight pods which become pendulous.

Next to water and the grasses, Sotōl, Dasylirion Texana, is the richest gift that Nature has bestowed upon the stockmen of western Texas. Indeed, were it not for the abundant presence of Sotōl and Nopal, the cattle and sheep of this region nearly all would have succumbed long ago to the effects of dry weather, as until within a few days this entire western region, it is said, has been passing through the longest continued drought that has prevailed here in thirty years. Our plant is a tall-growing member of the Lily family, attaining a height of six to ten feet, and bearing a large panicle of small yellowish flowers. It begins to appear near the parallel of Del Rio, and becomes very abundant farther north. When preparing to send up its flowering stems Sotōl develops an immense terminal bud, whose thick leaves and leaf-stems overlap each other so closely that they become blanched and tender. In them the plant stores the starch and sugar necessary for the development and growth of the flowers and fruit. Cattle unassisted will live and thrive upon the Sotōl-heads; but when ranchmen use them for feeding purposes the plants are dug, their roots being very small, and piled, and the long, narrow, sharply toothed leaves burned off, leaving the head about the size and form of a large cabbage-head. In that condition they are hauled in wagons sometimes ten or fifteen miles to the feeding-grounds, or are shipped from place to place on the railway. Before being fed, the heads are sliced with a Sotōl axe, the wide, ivory-white and polished leaf-stems separating. Sotōl-heads are very nutritious and fattening. They are said to make excellent well-marbled beef and mutton. United States people sometimes cook and eat the tenderer portions of the heads. Mexicans have a way of roasting them in an earth-pit. They also manufacture by distillation an intoxicant from the juice of the plant, which, it is said, resembles mescal in its taste and effects.

It is well that I spoke kindly of the weather and the winter as I did, for at the close of the same summer day, as I was sitting in my room, with both its north door and its south door ajar, suddenly the north door was forced open and the south door slammed shut. I did not have time to look to see who my rude caller was before a norther, with a howl, had entered the room. The next morning the ground was frozen and ice was abundant. These northers go howling on to the Gulf, blasting and withering every tender thing they touch, killing the young fruit and sometimes the trees themselves; freezing the recent wood of tender trees like the China and the Orange; cutting down the Corn when several feet tall, and sometimes forming ice in the bays and harbors of the coast. The term "norther" has become generic; and Texas has the dry norther and the wet norther, the latter species, of course, accompanied by rain, sleet or snow. Texans generally seem to regard the wet norther with more dread; but I am inclined to think that the dry species is the more destructive to vegetable, if not to animal, life. The air which it brings is so very dry that it quickly absorbs all the heat and moisture that animals and men have about them to spare, and then it searches for more, until it draws with wonderful power upon vitality itself. Within a short distance of the coast I have known the water in my sleeping-room to freeze at night, and men have frozen to death in the Gulf counties of the state. Storms of such extreme severity are rare, but they are among the possibilities of Texas weather.

Kansas City, Kansas. *E. N. Plank.*

## New or Little-known Plants.

### Populus Monticola.

IN the fourth volume of this journal a description and figure (page 330, fig. 56) of this remarkable Poplar-tree, discovered by Mr. T. S. Brandegee in Lower California, were published. In the present issue we are able to reproduce a photograph made by Mr. Brandegee during a subsequent visit to Lower California, representing the tree as it appears in winter, growing near the summit of San Pedro Martyr Mountain, the highest land in Lower California (see page 315). The photograph was taken in October, which is the end of the rainy season in Baja California, when nearly all plants are in full leaf and flower, although this Poplar, after the manner of the other species of the genus, loses its leaves in the autumn to regain them in early spring.

The location of the tree represented in Mr. Brandegee's photograph is a spring known as La Chuparosa, at an elevation of about six thousand feet above the level of the sea. The tree is nearly one hundred feet high, with a trunk three feet in diameter. In Lower California, Populus Monticola is not very abundant, except in a few cañons running toward Todos Santos Bay, in some of which there are as many as five hundred individuals. This species seems to belong to elevated mountain regions, although it will grow at lower elevations, there being fine specimens at San Anila, nearly at the sea-level, in the vicinity of San José Del Cabo. More recently Populus Monticola has been discovered in Sonora on the western slopes of the Sierra Madre.

A tree that will flourish at the sea-level in tropical heat, on mountain summits exposed to the frosts of winter, and in the drier climate of Sonora, must have a robust constitution, and would seem well adapted to thrive in southern California, where Populus Monticola would be handsomer than any of the species native to the state and a much more useful tree, for it produces comparatively hard light reddish-colored wood, valued for many purposes and suitable even for furniture.

We are glad of this opportunity to call attention again to the importance of introducing this noble tree into the gardens of southern California and the countries bordering the Mediterranean, where its beauty and rapid growth will make it valuable as an ornamental and as a timber tree.

## Plant Notes.

Victoria regia.—We noted several weeks ago some of the peculiarities of a new variety of Victoria regia at William Tricker's, Clifton, New Jersey. Since then it has made rapid progress, and is now in flower. The blooms prove to be distinct from any others which have been grown here, being not only larger, but of a really handsome shade of rosy pink. The color of the flowers of this giant Water-lily is often not very satisfactory, as it soon degenerates into a dull purple. The sepals of these flowers are smooth, not covered with spines, as usual. The newest leaf of the plant is now six feet four inches in diameter, measuring the five-inch rim, and as the plant gains in strength this size will probably be exceeded. The leaves have very little of the reddish tinge usual in the outside of the turned-up edges. A plant each of the ordinary V. regia and variety Randii in the same tank make a trio of the noblest of hardy aquatics and a most noteworthy sight.

Verbena Aubletia.—This Rose Vervain, from Missouri, is a hardy species, very vigorous in growth, forming broad mats of many branching stems furnished with numerous flattened, terminal clusters of deep reddish purple flowers. Verbenas of recent years, probably from overforcing and propagation, have been so much diseased that the florists have largely discarded them, and the florists' varieties are seldom seen in gardens. When well grown they are so useful and effective that their loss is much felt. It would seem that an infusion of the blood of such a vigorous species as V. Aubletia might be helpful in restoring the more showy varieties to health. Here is a suggestion for experimenters in hybridizing.

Plumbago Capensis.—This is one of the best known of the woody plants from the Cape, and it is adapted to a great many uses. In our southern states it is almost hardy, and makes a beautiful low hedge or screen. There are few better plants for training to the rafters of a greenhouse in summer, and, when grown in pots which can be plunged at the base of low walls out-of-doors, they produce a mass of bloom all summer long, while small plants set closely make an admirable edging for the border, and this is especially true of the white-flowered form of this plant. Not long ago we saw a large specimen plant trained to a slender lattice on the porch of a cottage; its rich foliage and dense masses of pale blue flowers in terminal clusters were particularly beautiful. This Plumbago is easy to propagate, and can be wintered under a greenhouse bench or in light airy cellar.

Clethra alnifolia.—It is only within recent years that the familiar Sweet Pepper Bush of our swamps has been propagated in our commercial nurseries, and yet it is one of our handsomest native shrubs, one which requires no special cultivation, and it will thrive in any fairly good garden-soil. The pure white and fragrant flowers of this plant, in upright racemes above its glossy leaves, began to open in this latitude more than a week ago, and they will continue well into September. The plant is smaller than the southern species, C. acuminata, which has nodding racemes of yellowish white flowers. In vol. iv., page 65, we published a portrait of the variety tomentosa of C. alnifolia, which differs from the species in having its leaves covered below with hoary tomentum, in its longer racemes and larger individual flowers. It has the advantage of blooming still later than the northern Clethra, and continues in flower until frost. It is also entirely hardy in northern gardens. In England C. alnifolia is often forced, and as the plants bloom under these conditions when quite small, the compact little bushes, not more than two feet high, and carrying numerous spikes of fragrant flowers, are very pretty.

Rhus semialata.—A variety of this tree, known as Osbeckii, has become quite common in plantations of ornamental trees in this country, and it succeeds as well in our climate as almost any Asiatic tree. In this latitude it begins to flower about the first of August, a season when few other trees are in bloom, and its large upright panicles of white flowers, standing well above the dark green long compound leaves, give it a striking appearance. The flowers are more handsome than those of our own Sumachs, the petals being pure white, although the light yellow color of the projecting anthers gives a cream-colored tint to the panicle. This tree soon reaches a height of twenty-five feet in good soil; its foliage is usually free from insects and fungi, and it has a round, pleasing outline, although the absence of foliage, except at the extremities of the branches, gives the tree a somewhat open and unpleasing appearance. The fruit is not so ornamental as that of our own Sumachs, nor do the leaves turn to such bright colors in autumn, although the species is one of the most brilliantly colored plants in the Japanese forests in autumn.

## Cultural Department.

### Collecting Kalmias.

SINCE we suggested the feasibility of getting a stock of Kalmias for cultivation by transplanting wild plants from their native haunts, we have received many letters of inquiry as to the proper methods of collecting and caring for such plants. Mr. Jackson Dawson, of the Arnold Arboretum, has probably had as large an experience in this matter as any one, and he has been very successful in growing the plants. We asked him, therefore, to reply to the questions most frequently asked—such as these: At what time is it best to lift wild Kalmias from the woods? What sized plants are the safest and best? How should they be treated after they have been collected? The article which follows is Mr. Dawson's instructive reply to these inquiries:

I would never take Kalmias from the woods when they can be found in an open pasture. The plants are more stocky when grown in the open, and have better roots than those from woodlands. I have lifted them at all times, from August to November, with general success, although I think the plants transplanted early stand the best chance.

As to size, I prefer plants not more than twelve to eighteen inches high, but the size is immaterial. If a good clump of earth is taken up with them, well-rooted and stocky plants three to four feet high may be transplanted successfully.

How ought the plants to be treated? First of all, the roots should never be allowed to become dry. When collecting the plants I always take with me a watering-can, so that I can keep the roots moist. If it is proposed to mass the plants in a large bed the soil should be well prepared beforehand. If peat can be had it is well to use a good portion of this as well as some sand with the loam. They like a sandy, peaty soil, though they will thrive in any good soil not too rich with stable-manure; when the soil is too rich the foliage will turn yellow.

As soon as the plants are received the larger ones should be set where they are to remain, made firm in the ground and thoroughly soaked. One watering should be sufficient, unless the weather is very dry, when an occasional syringing may prove helpful. As soon as the ground begins to freeze, a good mulch of leaves should be applied, and in an exposed place a few Pine or Spruce branches stuck in the ground among them will protect the foliage from burning. The poorly rooted and small plants I put in flats in sandy loam and keep them in a close frame or greenhouse for a month or two, syringing them often, but not too abundantly. At the approach of winter I place them in a deep pit or frame and plant them out in nursery-beds the following spring. In the beds they should have plenty of water until they are established. After the first year in the nursery-beds the plants can be lifted readily at any time during the season, even when they are in bloom. Last fall I helped load a car with large plants, two, three and four feet high. These, when taken from the car, were planted firmly where they were to remain, on a sandy hillside which had had

little or no preparation. The loss was not more than three or four plants in a hundred, possibly even less. The planting was done late in September.

Some years ago I had a lot of plants, two to three feet high, brought from a distance of a hundred and sixty miles. These were at once planted in a well-prepared bed. They were watered twice and mulched as soon as winter set in, and out of two hundred plants I do not think that two died.

The Mountain Laurel is very hard to kill. One year I set five hundred of these shrubs in a bed, and as the season was late they were covered with leaves and brushes. In the spring I could not find even one of the plants. The moles and field-mice had nested in the litter and had eaten them all off close to the ground. Having already given so much care to the plants, I did not like to throw them away, and therefore set them between nursery-rows. Before the end of the summer the greater portion of them had broken into growth, and in two years' time they were well-grown, stocky plants. When once well established a Mountain Laurel plantation may be burned to the ground, and it will soon recover and make a better appearance than before.

No more suitable plant can be found for the border of a wood or as an undergrowth to plantations than the Mountain Laurel. It is always attractive, whether in flower or not, and it will bear more cutting than any other shrub.

some parts of Europe; and the very general damage to the fruit by the attacks of a fungus or mildew, Erysiphe Mors-uvae, proves a serious obstacle to the successful cultivation of the fruit in many parts of this country.

Our American species seem less liable to have their fruit badly affected by this disease, and the few improved and valued varieties already derived from them have given great satisfaction. About the only complaint that is generally made against such varieties as Houghton's Seedling, Downing and others is the small size of the fruit when compared with the best imported or so-called English varieties, although the discrepancy in size may be made up in the greater abundance of the berries.

By many persons Houghton's is regarded as a hybrid between our native Ribes oxyacanthoides and some garden variety of the foreign species rather than a simple improvement of the R. oxyacanthoides or some other species, as sometimes stated. Whatever its origin, it is a good illustration of the line in which progress may be made.

Ribes oxyacanthoides, or R. hirtellum of some botanies, is one of our commonest native Gooseberries. It is a medium-sized bush, with rather slender stems and slender prickles. The berries are produced on short stalks, and usually have a sweet, pleasant flavor when fully ripe; they are purple and have a perfectly smooth skin. On account of the small size of

Fig. 51.—Populus Monticola, in Lower California.—See page 313.

## Notes on Trees and Shrubs.

WHEN we look back to the original or wild type of the common Gooseberry of European gardens and imported into our own, we ought to have much hope of evolving some excellent horticultural varieties from our native species by careful selection and cultivation, although this process may take many years before we achieve any success as marked as that which the patient cultivators of the Old World have won after centuries of work. Beginning with a much-branched prickly shrub bearing small yellowish or greenish berries, usually sprinkled over with stiff hairs, but occasionally glabrous, or nearly so, and usually less than half an inch in diameter and a quarter of an ounce in weight, the European cultivators have so improved their native Gooseberry, Ribes Grossularia, that some varieties bear fruits two inches in diameter and an ounce and a half in weight, while the innumerable varieties are classed according to color as red, yellow, green and white. It may be argued that having already attained such variety and seeming perfection in the European species it is scarcely necessary to start out on a new and possibly parallel line, especially as the European Gooseberry is quite hardy in cold climates, though probably not so resistant as some of our natives. But the imported Gooseberry in this country does not seem to grow to such perfection as it does in the wild fruit, however, this species is not as promising as some other kinds of native Gooseberries.

Ribes Cynosbati, for instance, seems to have been almost totally neglected by horticulturists, although some good results might be expected from a comparatively short series of careful experiments and selections. To start with, the wild fruit is commonly twice the size of that of R. oxyacanthoides, large, nearly round berries fully half an inch in diameter not being unusual. When fully mature the berries, although rather thick-skinned, are often sweet and very pleasant to the taste, being usually at that time of a brownish purple or greenish purple color. Ordinarily these berries are covered by numerous long, stiff, formidable-looking prickles, which, if they could not be eliminated, would prove a permanent objection to the cultivation of the fruit. But plants with perfectly smooth berries are not rare in a wild state, and individuals with or without prickles on the fruit may be raised from the same lot of seed collected from one plant. The berries are produced either singly or two or three together on slender forked stalks an inch, more or less, in length; and they are often very abundant. This species is perfectly hardy, being found wild far north into Canada and west to Minnesota. Its stems are not so prickly as those of the European Gooseberry, and varieties practically without prickles should be easily procured. Hybridizing with the best forms of the cultivated

European Gooseberry should bring out some interesting results.

There are other species of native Gooseberry, such as Ribes rotundifolium and R. Lobbii, of the Pacific slope, which will yet prove of economic value, if, indeed, their usefulness has not already been locally demonstrated; for, although the fruits may be smaller than those of R. Cynosbati, they are often very appreciably larger than the berries of R. oxyacanthoides.

Arnold Arboretum. *J. G. Jack.*

## Crops in an Orchard.

IT seems a long time to wait for the fruit of a young orchard, especially an Apple-orchard; and with many it is important to utilize the land for other crops, while the orchard is growing. An experience of upward of forty years in planting orchards and managing them, does not, indeed, qualify the writer to utter the last word on such a subject; and, in fact, location must have much to do with it. All my experience in this business has been gained where a good market was within short driving distance. Consequently, I have planted in my orchards mainly the smaller fruits which come into bearing quickly and furnish an income with but little waiting. Young fruit-trees of the same or other species with the orchard may be safely grown between the permanent rows; while between the trees in the rows there is an excellent opportunity to plant such small fruits as Currants and Gooseberries. These may profitably remain until the trees come to full bearing, or at least for ten years. I have also grown Rhubarb and Asparagus in young orchards, between the rows, for as long a time, without any injury to the orchard.

After growing one or two nurseries of trees between the rows, I have found no crop so satisfactory as Beans. These seem to do even better in partial shade than in the full sunlight. I am still growing Beans in an orchard fifteen to twenty years planted, getting full crops, which pay for their own manuring, and leave a good deal for the trees. There is no better mulch for young fruit-trees than bean straw, in which I have never known mice to harbor, and which in its decay furnishes an effective fertilizer.

Strawberries do fairly well in a young orchard for six or seven years; but the beds of these must be narrowed as the branches and roots of the trees extend themselves; and, in fact, four years are about as long as I should want to continue them.

Corn is a good crop in a young orchard, as it does not attain much growth until most of the tree-growth is made. It is better to plant Sweet Corn, the ears of which are to be sold green, and the stalks then cut for green feeding to cows.

Potatoes are an injurious crop in an orchard, as the growth is simultaneous with that of the trees. There are a number of garden-vegetables which do well for several years. I have many times grown good crops of carrots in an orchard, even after the trees had acquired considerable size, the short-rooted sorts being preferred.

All of this, of course, presupposes liberal fertilization, which in my practice is alternately with stable-manure and with fertilizers. With stable-manure Corn has appeared to me to be the best crop, the unconsumed manure, with the Corn-roots and stubble, being very acceptable nourishment to the young trees. A fall crop of flat turnips can often be taken successfully from a young orchard without harm.

All this must be understood as done under pretty high culture, with free use of manures. Nothing to check the growth of the trees is allowed, as that is the main objective point. But it is astonishing to an inexperienced observer how much of useful and profitable growth can be taken in this way from a young orchard, and the practice especially aids the grower to accord to the orchard that feeding and cultivation which it needs, and which is often necessarily grudged and withheld when no immediate return is hoped for. The suggestion came naturally to me at first from seeing how well fruit-trees do when planted in well-kept gardens, and it is, in fact, only an extension of that practice. I have never seen any injury result from it, and might easily cite other advantages.

Newport, Vt. *T. H. Hoskins.*

## Chrysanthemums.

UNDER a thorough system of stopping their shoots, specimen plants should now assume a neat regular outline. Additional supports should be added and some tying done to get them still further into shape. There should be a proper distribution of the shoots, and, if necessary, stunted growth should be cut out, so as to admit light and air freely all through the plants. Well-preserved foliage is of scarcely less importance than fine blooms. With the exception of some late kinds, such as C. B. Whitnal, White Cap, Mrs. H. J. Jones and a few rather straggling growers which need to have runaway shoots stopped later, all should now be allowed to grow. They should be syringed freely on all bright days. This tends to keep down insects and promotes the growth of clean healthy foliage.

The application of stimulants is a work requiring very great care, and only experienced persons should be entrusted with it. The pots must be filled with healthy roots, and the drainage free, to begin with. No excess of solid matter ought to lie on the soil, to prevent the free passage of water. If cow-manure be used as a top-dressing it should be first dried and then broken into small pieces. This acts as a mulch and fertilizer as well. As a safe and lasting fertilizer, applied as a top-dressing, we prefer pulverized sheep-manure, with just a dash of sand and loam to keep it open. Liquid-manure may be applied also if the plants continue healthy. It should be given often, say, once a week at first, and two or three times a week later on, but never at any time very strong. Drainage from stables is one of the best fertilizers known, as it contains nearly all the ingredients of a complete plant-food in a concentrated form. I seldom use it stronger than one part in twenty of water. If bituminous soot can be obtained it is beneficial, and may be used with some device for filtering water through it. Droppings from the hen-house are dangerous when used in any quantity in this way. Where lime is not an ingredient of the soil, a pound or two once in a while will do good work. Sulphate of ammonia is sometimes used with wonderful results, but unless its strength be known it is not quite safe. Among commercial fertilizers guano ranks high. It does not, however, contain all the elements required, and so gives better results when used alternately with other manures. Guano is best applied in the liquid form, and while it may be safe to use more than one pound to fifty gallons of water, I confine myself to this limit. When applying commercial fertilizers occasional plants will not be able to stand the regular dose, which will be shown by the leaves turning pale green; these should be passed until they resume their natural color, and always after that a smaller quantity should be given. At the same time, when clear water only is used, they should have no more than enough to keep them from wilting, for a few days. This gives the soil a chance to sweeten.

Plants for specimen blooms ought to be making strong growth, and they, too, will need a little extra plant-food. The mixture recommended for specimen plants will be found the best for them. All side-shoots should be carefully taken off, and crown-buds which are too early taken out, and one or two shoots, as may be required, allowed to grow. Charles Davis, good only on a crown, may be taken any time, as may also Lady Playfair, Mrs. E. G. Hill, Mabel Simpkins, Mayflower, Yellow Queen. Domination, Ivory, Cullingfordii, G. W. Childs and Viviand Morel are best on terminals, and crowns appearing now on these should be removed.

Wellesley, Mass. *T. D. Hatfield.*

## Hardy Plants which Flower in late July.

LILIUM NEPALENSE, a species from the central Himalayas, has flowered here in the open ground from a bulb planted in May. I have seldom seen a more healthy plant, and though it is said to be a greenhouse species, I shall leave it in the ground during winter, well protected from frost. It attains a height of about two feet, bearing one to several white flowers, purple inside toward the base. The flowers are about five inches long and nodding.

Lilium superbum, var. Carolinianum, is a distinct form which flowers about midway between the seasons of L. Canadense and the true L. superbum. It is more dwarf in size, and its petals are more reflexed, being turned back about as much as those of L. Columbianum when fully matured. It is perfectly hardy and thrives in situations adapted to L. Canadense.

Campanula Carpatica alba is a very prolific bloomer and bears its charming white flowers, a little more than an inch wide, on stems of fairly good length for cutting. C. Ræneri, about the same size, blooms with it, but its flowers are blue and a little smaller.

Platycodon grandiflorum and P. Mariesii are two desirable plants, with large deep purple-blue bell-shaped flowers, quite hardy and easy to grow. The variety Album, of P. grandiflorum, is very desirable.

Aster Douglasii, from northern California, is much earlier than most of our native Asters. It produces flowers in the greatest profusion, which are nearly white and about three-

fourths of an inch across. Aside from its comparative earliness it is of no more value than many of our most common species.

Pentstemon gracilentus, from northern California, has a greater number of flowers on a panicle than most species of this genus, though they are individually small. They are about three-fourths of an inch in length and purple in color.

One of the more striking plants just flowering now is the perennial Globe Thistle (Echnops Ritro), from southern Europe. The large round heads of blue flowers are quite attractive.

The Cardinal Flower (Lobelia cardinalis), which is so commonly found gleaming among the rank vegetation on boggy soil, does admirably treated as a garden-plant. It takes kindly to drier land, and when properly cultivated it attains a greater height, with longer spikes of its deep cardinal-red flowers. It blooms earlier, too. Rhexia Virginica, the Deer Grass or Meadow Beauty, is another attractive native plant at this season in the border, where it attains a height of about ten inches, bearing numerous rose-purple flowers an inch across.

Charlotte, Vt. *F. H. Horsford.*

## Notes from Cornell University.

Currants.—Mr. S. D. Willard, of Geneva, recently sent specimens of the Wilder currant and of the White Imperial currant to the station to be tested. The Wilder is a red currant with stem and berries as large, or larger, than the Fay's Prolific, and a little less acid than Fay's. It is a beautiful variety and promises to be a valuable acquisition to commercial curants. No currant as sweet as the White Imperial has been tested here. The clusters and berries are of good size when compared with the White Grape; the difference in acidity seems as great as that between sour and sweet cherries. This variety can be highly recommended for family use. A new variety, which resembles the Versailles in cluster and berry, was received from Albertson & Hobbs, Bridgeport, Indiana. Its favorable points are less acidity than Versailles and the small number of seeds which it contains, each berry having only from three to eight.

Sweet Corn.—A test of sixty-one varieties of Sweet Corn is being carried on at the station. The Corn stands on a piece of ground that has received uniform treatment for the past ten years. The object of the test is to determine the earliness, productiveness and quality of each variety. The stalks of each kind have been counted and a record is made of the tasseling, of the appearance of silks, of the first roasting ears and of the yield. The Corn has received high cultivation, and with the uniform conditions the results should be fair and reliable.

Club Root of Cabbage.—This fungus (Plasmodiophora Brassicæ, Wor.), which has been quite destructive to the Cabbage and Turnip crops in New Jersey, and in the truck-gardens around Philadelphia and New York during the past few years, is receiving attention from the station. The disease is caused by a fungus, which causes the roots to become swollen and distorted. It affects the cabbage and vegetables belonging to the Cabbage family, and also the Shepherd's Purse (Bursa pastoris, L.), and the Hedge Mustard (Sisymbrium vulgare, L.) Two barrels of soil, in which the disease had been prevalent, were imported from Long Island in the spring, and Cabbages set in the plot in which the soil was mixed. Every plant examined has the disease and is rendered useless for market purposes as growth ceases. This shows the highly infectious character of the disease. As the fungus is known to live on certain kinds of plants only, Buckwheat will be sown on part of the plot to determine whether the fungus can be starved out in one season.

Cornell University. *G. Harold Powell.*

## The Kitchen Garden.

Most vegetable-gardens in this vicinity now present a sorry spectacle on account of the parching drought, but even in places where irrigation is not practicable, if the surface has been kept constantly stirred the lack of rain will not be so seriously felt. Of course, it is always in order to kill weeds, one great reason for this being that the weeds are taking the water which the plants need. But, as has been often explained in Garden and Forest, this surface tillage has a value beyond the mere destruction of the weeds, and it is most useful when the weather is dry and hot, as it generally is in midsummer. The ground should not be stirred so deeply now that the moist soil is brought up from below, for the water evaporates and is wasted, and just now every drop of moisture should be husbanded with care. Evaporation goes on from the surface, and the loosening of a thin layer of top soil acts as a sort of mulch or a blanket full of air-spaces, and checks the waste of the water which rises from below. So far as possible all the water that now escapes from the ground should be utilized—that is, it should be taken up by the roots and pass away through the leaves of the plant.

Where the ground is not dust-dry, varieties of Peas which grow low and ripen rapidly may now be sown, for, although the autumn crop of this vegetable is precarious, the vines will sometimes escape mildew and yield fair crops before frost. Some Cucumber-seed may still be planted in frames, where the plants can be covered before the earliest frosts. From plants now in bearing the mature fruit should be picked every day, and they will continue producing longer than they will if seed is allowed to ripen. Fresh tobacco-stems scattered among them will repel plant-lice. Caution should be used not to step on the plants when picking cucumbers and melons, and in the case of melons more perfect fruit can be had if pieces of board are placed under them to keep them off of the ground.

Late Turnips for table use should grow quickly if they are to be crisp and sweet, and such growth is made in cool autumn weather. The latter part of August is abundantly early to sow such varieties as Purple-top, Strap-leaf or the Flat Dutch. When grown to the largest sizes, these are not fit for table use, and this is another reason for late sowing. Of course, the ground should be rich to insure the quick growth, which is a prime necessity. The flea beetle often attacks the plants as soon as the earliest leaves appear, but this insect can usually be driven away by a sprinkling of slacked lime. If the lime alone will not suffice, a little Paris green can be mixed with it in the proportions, say, of one part of Paris green to two hundred parts of lime.

It is hard to grow good crisp Lettuce in hot and dry summer weather, but the middle of August is a good time to make a sowing of seed to head in frames, and another sowing should be made the last of the month, and this can be used in late autumn, and even up to Christmas.

New York. *S.*

**Strawberries.**—If a Strawberry-bed is to be kept for one or more years, it should be worked over as soon as possible after the crop is gathered, in order that the new plants may find a soil in suitable condition for starting into growth. If the field contains much grass and tall weeds, it is often a good thing to cut them with a mower, and if there is so heavy a mulch that it will hinder working the land, it can often be burned off. The fire will also destroy many insects, and, as the old Strawberry-leaves will also be burned, most of the spores of the leaf-blight will be destroyed and the injury the following year lessened. The bed may be broken up in various ways, one of the best being to turn furrows away from either side of the row, leaving only a narrow strip with plants upon it. The furrows can then be worked down with a cultivator, and the rows of plants thinned out and freed from weeds with a hoe. In this way the ground will be broken up and prepared for the new plants that will be formed. Especially if the summer is a dry one, the cultivator should be kept going throughout the month of August, so that a crust cannot form. The new plantations also should receive similar care, so far as cultivation and hoeing are concerned. One of the principal reasons for the running out of varieties is that they become subject to and weakened by the rust or leaf-blight. In the case of some varieties, much of the foliage is entirely destroyed, and the spots are so numerous upon the flower-stems that they are girdled, and as a result they shrivel and the fruit dries up. From this cause half the crop is often lost. It has been found that this disease can be kept in check if the plants are properly sprayed with Bordeaux mixture. This should be put on in July or early in August, in order that the plants may make a healthy growth during the fall. This should be repeated in the spring before the growth starts, and again as soon as the blossoms are off. By the last application the flower-stalks will be covered with fungicide and the chance of the drying up of the berries is thus reduced.—L. R. Taft, *in the American Agriculturist.*

## The Forest.

### Mixed Oak and Beech Forests of the Spessart: Management by the Bavarian Government.—III.

#### Regeneration of the Oak by Self-sown Seedlings.

The third special point to which the attention of the Bavarian Government was directed was the regeneration of the Oak. At first these mixed Oak and Beech woods were treated uniformly on the usual plan, the mature timber being removed gradually by successive cuttings, so as to

allow self-sown seedlings to spring up and to afford shelter to the young growth. Under this plan some Oak would come up among the Beech, more in places where the Oak predominated, less where single trees were scattered among the Beech. Gradually, however, it was discovered that in the Spessart the Beech had a much more vigorous growth than the Oak; that Oak-saplings standing alone in a mass of Beech were, as a rule, doomed to extinction, and that of groups of Oak surrounded by Beech a few trees only would remain, the rest being overtopped by the Beech. Great exertions were made to save the Oak by cutting away or lopping the Beech which threatened its existence. But it was soon seen that this was a gigantic task, which, over such large areas, could never be fully accomplished. Hence attempts were made to establish large patches stocked with Oak, and thus to facilitate their protection against encroachment by the Beech.

The plan followed until about 1865 was briefly this: On the occurrence of an Oak-mast everything was done to promote the springing up of Oak-seedlings in those compartments where the working-plan permitted such operations. In those compartments, therefore, in the vicinity of all Oak-trees which had produced acorns, the greater part of the Beech was cut, leaving only a proportion of smaller and younger trees to serve as shelter. Whenever necessary the ground was dug up, generally in lines, or it was otherwise made raw to facilitate the springing up of Oak-seedlings. The result was that extensive thickets of Oak sprang up wherever in the compartment selected there had been seed-bearing trees. The intermediate space, which was occupied by pure Beech, was left untouched until it was convenient to take it in hand, and then, on the occurrence of a Beech-mast, it was regenerated in the usual manner by means of successive cuttings. In this manner two classes of young forest were obtained—irregular plots varying in size, where the Oak predominated, not pure, for Beech-seedlings would spring up among the Oak, and the intervening space stocked with pure Beech. With careful management it obviously was possible in this manner somewhat to extend the area stocked with Oak, and the good results of this system are seen in extensive young woods, now from thirty to seventy-five years old, in which the Oak predominates.

These young woods are singularly beautiful, the Oak, having from the commencement been associated with the Beech, has formed straight clean stems without side branches, the bark without lichens, of a beautiful silvery-gray color. But these mixed woods have this disadvantage that the Beech is apt to overtop the Oak, and unless cut out or cut back frequently it gets the upper hand and kills out the Oak. These young woods therefore demand constant attention, and the operation of cutting down or lopping the Beech which threatens to interfere with the Oak costs money.

### LARGE OAK AREAS RAISED BY SOWING ACORNS.

The chief drawback, however, was found to be that a really considerable extension of the Oak-woods could not be effected by the natural method, and hence the artificial formation of Oak-wood was more and more resorted to. Great experience has now been gained in this matter, and the result of this experience has developed a very perfect system. The acorns are sown broadcast, the entire area being dug up, or in dug-up lines two to three feet apart, the acorns being sown thick in the lines. Should there be young Beech on the ground it is cut down, or if not too large pulled up.

At first alternate bands sixty to seventy feet wide were sown with Oak, the intervening bands being regenerated naturally as Beech-woods by successive cuttings. This plan answers well where the soil is uniform; a much better arrangement, however, which is now generally followed, is to select localities with deep and rich soil for the Oak, and to leave places with poor, stony and shallow soil to grow the Beech on, or, where necessary, to raise Scotch Pine and Spruce. These places suitable for the growth of the Oak are selected long beforehand and are marked out on the ground. Only acorns grown in the Spessart are used, and as acorns do not keep, this system depends upon an Oak-mast occurring in this locality nearly as much as the system of natural regeneration. There is, however, this difference, that small quantities of acorns are produced almost every year, and that these can be utilized in sowing some plots which are sufficiently advanced for the reception of the acorns. Obviously, however, the main sowings can only be made when a good mast year occurs.

The plots selected for the growth of Oak are not much smaller than an acre, and are sometimes as much as twenty acres in extent. On these places the forest is cleared, a number of the smaller trees being left to serve as shelter to the young Oak. For a year or two the ground is left untouched, exposed to rain and sun. The result is that the dense cover of dry leaves decomposes sooner, and when the first thin coating of grass makes its appearance the time has come to bring in the Oak. The surrounding Beech-forest, which had been left untouched, is taken in hand for regeneration in the usual manner, and wherever this can be done it is arranged that the Oak shall have a few years' start of the Beech. Around all Oak plots narrow paths are cleared to prevent the margin trees being overtopped by the Beech. The Oak areas within a compartment at once strike the eye by the dark green of their foliage, and they stand out clearly from the lighter green of the surrounding young Beech-woods. These Oak areas, being the most important portion of the forest, are objects of constant interest and frequent visits by forest-guards, executive officers and inspecting officers. Isolated Beech-trees, which frequently spring up among the Oak, are not disliked, and in these limited areas they can more readily be kept under control than when the Oak is scattered over large areas.

Bonn, Germany. *Dietrich Brandis.*

## Correspondence.

### Woad Wax.

To the Editor of Garden and Forest:

Sir,—I learn from the article by Mr. Jack, in your issue of August 1st, that correspondents of the Boston newspapers are exercised over the possibilities that Woad Wax may become a pestilent weed. But, in the light of comparatively recent scientific discovery, is it not possible that this plant may prove a blessing? Certainly, leguminous plants differ from others in their relation to the soil. As a rule, plants which grow and die down on a piece of ground add nothing whatever to it except some carbonaceous matter which they have taken from the air, and which is not really plant-food. For a hundred years farmers have been claiming that Clover actually enriched the soil, and that even after the crop was cut off and carried away the land was rendered more fertile by the decaying roots. Men of science pronounced this impossible, but Sir John Bennett Lawes found by analysis that soil in which Clover had been grown contained more nitrogen than it did before the seed of the Clover was sown. Nevertheless, since the leaves of plants do not take up the free nitrogen from the air, and since the roots cannot get it, the men of science argued that the long fibrous rootlets of the Clover must bring up the nitrogen of compounds already in the lower strata of the ground, often from a depth of several feet below the surface. More recent discoveries have shown that leguminous plants have the power of obtaining nitrogen directly from the air, and that they are enabled to use it as plant-food by the help of microscopic organisms, which are always found in the soil where these plants grow. Just how this is accomplished the scientists have not yet been able to explain fully. What seems to be established is that these bacteria cause the growth of little tubercles on the roots of the plants, and somehow through these the nitrogen is assimilated.

Now, this Woad Wax is a leguminous plant. Its roots are covered with these little nodules, which show that the bacteria are at work preparing the nitrogen of the air, to be taken up and used in the plant. Such plants as the Clovers, Serradella, Alfalfa, Lupine and Cow Peas are often used for green manuring, as it is called—that is, they are turned under for the

express purpose of adding to the soil the nitrogen which the plant has taken from the air. This process pays, because, while the other elements of plant-food which are lacking in unproductive soils—namely, potash and phosphoric acid—cost only five or six cents a pound, nitrogen costs three or four times as much. Now, may it not be that this Woad Wax is helping to enrich the waste lands of eastern Massachusetts, instead of impoverishing them? If Woad Wax will thrive where little else will grow, why not encourage it? Perhaps it might be worth while to plant it and to plow it under as a green manure. Like many other leguminous plants, it may need a special form of bacteria to aid it in capturing nitrogen. Peas, for example, sometimes fail to grow unless nitrogenous manures have been furnished them, but on the same lands, if a light dressing of soil, in which Peas have been grown before, is given to the land, the crop will grow without the application of any nitrogen except that furnished by the air. This means that the top-dressing has inoculated the soil with the special bacteria which live in connection with the Pea-roots. It might, therefore, be necessary, in order to insure the growth of this Genista in any worn-out land, to inoculate it with a dressing from soils where it has grown before.

Perhaps the directors of some of our experiment stations may consider this subject worth attention.

New Brunswick, N. J. *R. S.*

[Our correspondent has fairly stated, in a popular way, what is known as to the power of plants of the Pulse family to store up nitrogen from the air. In many cases soils can be enriched with nitrogen cheaply and effectively by plowing under crops of Cow Peas and other legumes. We are hardly prepared to recommend the cultivation of Woad Wax for this purpose. Plant crops which can be utilized as food for animals would plainly be preferable in situations where they can be grown. Nevertheless, the suggestion that Genista Tinctoria may prove an instrumentality of bringing up sterile soils to a condition of comparative fertility is worth considering, and we should be glad to hear from other correspondents to whom the subject is interesting.—ED.]

## Seedlings from the Shaffer Raspberry.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue for July 1st, page 288, I note that Mr. Powell writes: "So far [referring to the Shaffer Raspberry] all of its seedlings turn out to be pure black, and none of them remarkable in any way." This is much at variance with my experience with them. In 1891 we sowed a small amount of Shaffer seed from plants growing near those of Marlboro and other varieties, but without any effort at cross-fertilization. From this sowing about four hundred seedlings were raised, the most of which fruited last year, but none of them showed pure black-colored fruit, and that of most of them was a dull red, occasionally a purple, with a few bright red. The fruit from thirty-eight plants was considered worthy to be sent to the Exposition last year. The canes and general appearance of most of the plants plainly showed the Shaffer parentage. A few plants, perhaps half a dozen, resembles the Black-cap in cane and general appearance. All those selected as being of possible value closely resembled the Shaffer, and all are difficult to propagate from the tips.

Experiment Station, St. Anthony Park, Minn. *Samuel B. Green.*

## Recent Publications.

*Fungi and Fungicides.* By Clarence M. Weed. New York: Orange Judd Co.

This is not a work for scientific students, but a practical handbook which explains the various methods, so far as they are known, of preventing and curing the ordinary fungous diseases of cultivated plants. The book makes no pretense of originality, but is a compilation of matter which, during the last few years, has been published in various bulletins, reports and periodicals in relation to the life-histories of fungi which are destructive to plants, together with the characters of the diseases they cause, and the approved ways of treating them. In the introduction Mr. Weed gives some data from which we can form some estimate of the losses which are caused by these diseases. A Commissioner of Agriculture has stated that corn and wheat, to the amount of $200,000,000 at least, are annually destroyed by fungi. It is probable that fruit suffers in even greater proportion than field crops. For example, the loss from the apple-scab ranges from one-sixth to one-half of the entire product. In one year the loss of peaches from the brown-rot in the Chesapeake and Delaware peninsula alone was half a million dollars. Rots and mildews cause losses in the grape crop that are almost incalculable.

Ten years ago there were not a dozen scientific men in this country who were giving serious study to the diseases of plants from an economic standpoint, but in almost every experiment station now the subject of plant-diseases is one of the regular lines of work, and it is largely owing to the investigations in these stations that we have learned the cause and cure of the potato-scab, and have become familiar with the Bordeaux mixture and other fungicides in treating Pear leaf-blight, apple-scab, raspberry anthracnose, Plum leaf-spot and potato blight and rot. This little book only treats of the more destructive and widely spread diseases, and especially of these for which some more or less successful treatment has been discovered. After a few pages of introduction, in which some of the elementary facts in regard to the life-history of fungi are given, the fungous diseases affecting the orchard fruits are first discussed, and then those affecting the small fruits. The diseases affecting shade-trees, ornamental plants and flowers, kitchen vegetables, cereals and forage crops are then discussed in order. Altogether, the manual is convenient and ought to prove useful, as it contains facts with which every gardener and fruit-grower ought to familiarize himself.

## Periodical Literature.

Mrs. Katherine Brandegee has just published, in the *Proceedings of the California Academy of Natural Science* (ser. 2, iv., 173), the results of a long and careful study of the difficult genus Ceanothus, which, finding its greatest development in California in many beautiful species, makes in early spring one of the most conspicuous and attractive features of vegetation, especially in the Coast-range region south of the Bay of San Francisco. The last study of these plants was that of Dr. C. C. Parry, published in the fifth volume of the *Proceedings of the Davenport Academy of Science*, where thirty-two species were recognized, and where, for the first time, the prevalence of natural hybrids in this genus, the ease with which these may be recognized in the field, and the corresponding difficulty of their separation in herbaria, were pointed out. According to Mrs. Brandegee, "the hybrids of Ceanothus are found wherever two species of the same section grow together. As a rule, to which there are, however, many exceptions, no two species of the same section occupy the same area. Either one grows at a higher elevation or at a different exposure, and the hybrids occur along the lines of junction. They seem usually to be fertile, and show every gradation from one to the other parent.

"Ceanothus is very readily and completely killed by the fires which so frequently run over the chaparral hills of California. About the places where their parents grew the seedlings then spring up in great numbers, although they are otherwise rarely seen. A certain proportion of these seedlings are always, where two different forms have grown intermingled, found to be hybrids. If the district should be again swept by fire before the seedlings bear fruit the species in that locality would be exterminated, with, perhaps, an occasional sheltered exception, which may almost as readily be a hybrid as one of the parent forms. In this way, as may readily be conceived, a fertile hybrid might become established as the prevailing form in a given district. Where the seedlings survive in great numbers, cross-fertilization being made certain by the swarms of insects attracted to their fragrant flowers, a continual crossing takes place, not only between the original forms, but between the hybrids and their parents on either side."

In this paper the number of species is reduced to twenty-one, divided into two sections, Euceanothus, and Cerastes with the three closely related species which Mrs. Brandegee suggests may, perhaps, best be treated as varieties of one. In addition to species many hybrids are described. Under each species the original description is published verbatim, because "the modification which descriptions undergo by increasing knowledge of their variations is often very great, and it seems to me the duty of monographers to give the original diagnoses in addition to their own, so that readers may be in possession of the data necessary to form some sort of independent opinion without the necessity of acquiring a considerable library."

Although Mrs. Brandegee does not consider her study of Ceanothus final—indeed, it will never be possible to elucidate for all time the species of a genus in which so many varieties and hybrids are constantly occurring—it is, nevertheless, a very substantial and useful contribution to our knowledge of one of the most difficult, as it is one of the most interesting and beautiful, groups of plants in the flora of North America.

## Notes.

Hibiscus Syriacus, the European Shrubby Althea of gardeners, is reported as thoroughly established in a wild state about Stone Mountain, in Georgia.

Mr. J. A. Pettigrew, for many years the efficient Superintendent of Lincoln Park, Chicago, has been appointed Superintendent of the park system of Milwaukee.

Mr. F. Le Roy Sargent, of Cambridge, Massachusetts, has recently published a little pamphlet called *How to Describe a Flowering Plant*, which consists of detailed directions for analysis, based upon Gray's *Lessons in Botany*. Such a work ought to prove useful to beginners in botany.

The report of the first convention of Ontario Good Roads Association has just been published by the Department of Agriculture of that province. The proceedings, together with an instructive appendix on various practical subjects connected with road-making, fill a neat pamphlet of sixty-four pages.

The Pennsylvania Forestry Association has offered a prize of $50 for the best essay and $25 for the second best essay prepared by teachers in the public schools in that state, upon the "Practical Value of Forests to the Surface of the Country." The teachers everywhere in the state are invited to enter the contest.

An application of Bordeaux mixture or some other good fungicide should be given to Gooseberry-bushes after the crop is harvested, as a check to the mildew. This enables the plant to hold its leaves late and to thoroughly ripen the wood for the next year's crop. This late application is quite as necessary as the early ones if good crops are to be had every year. The same treatment should be given to Currants.

This is the time to prepare window-plants for winter-flowering. Cuttings may be taken of soft-wooded plants like Geraniums, or medium-sized plants in the garden may be taken up, cut hard back, both roots and tops, and placed in pots just large enough to contain them. If they are set in a cellar or in a shady frame where the air is close, or, at least, where the wind does not dry them out, and kept well watered, they will make good roots very soon and they will be well established for the winter.

In an address before a horticultural society in the state of Washington, Mr. M. C. Latta stated that Currants in that state set three feet apart in rows six feet from each other, would, at a conservative estimate, produce when in full bearing—that is, the fourth year after planting—an average of seven pounds of fruit to the stool, or about 17,000 pounds to the acre. Such an estimate may be conservative on the Pacific coast, but growers hereabout would not complain if their Currant-fields yielded an average of three or four tons less than this to the acre.

In some notes on the White Pine in the last number of *Forest Leaves*, Professor Rothrock notes the behavior of the leaves of this tree under various climatic conditions. Clusters of these leaves start from a single point, and in clear weather they separate and stand away from each other so as to form an open whorl. Under these conditions the tree-top is a mass of feathery foliage. When the weather is cold and damp the leaves close in upon each other and droop until the entire expression of the tree is changed and the top becomes open so that one can look through it in almost any direction.

Rarely do our farms and gardens suffer from a drought so widespread and prolonged as the one which now prevails in the Atlantic states. Almost every year, however, there are localities in which special garden-crops at different seasons entirely fail for lack of rain. The gardens in this region should now be yielding an abundant supply, but a greater portion of them are not producing a single vegetable for home use. This is a hardship which can hardly be appreciated except by those who live at a distance from great markets which lay under contribution the products of a continent. In regions of rainless summers where irrigation is a necessary practice such hardships never occur, but it would seem wise if provisions for watering the home-garden, at least, should be made in climates where the rainfall is usually sufficient. There are few farms in the middle states where the vegetable-garden could not be so placed that it could be irrigated at small expense. At such a time as this facilities for watering garden-crops would save a good deal of money in many rural households, besides adding materially to their comfort and health.

The beautiful Honeysuckle, Lonicera flava, Sims, is one of the rarest and most local plants, being known, until recently, in only two localities—on the summit of Paris Mountain, in South Carolina, and in one spot in the upper districts of Georgia. Now Mr. John K. Small reports in the *Bulletin of the Torrey Botanical Club* that he found it last spring "in full bloom on the summit of Little Stone Mountain, Georgia." This mountain, he tells us, is a flat granite dome about nine miles distant from Stone Mountain itself, rising about one hundred and fifty feet above the surrounding plain; the slopes are nearly bare, consisting of flat granite pavements, but a small area of the top is capped by a layer of sandy soil several feet thick. This is covered by a rather dense growth of shrubs and trees, except the highest point, which is several square yards in extent. Here three plants of L. flava grow, spreading over the undershrubs and the ground. It is a most handsome plant when in flower, and on a second visit in July the abundant fruit was just about maturing. During a month's exploration of the vicinity no other station was observed, but at a later trip Mr. Small found several plants growing in the woods on northern cliffs of the mountain.

The first Flame Tokay grapes of this season from California were sold here last Monday, together with a variety known as St. Jacob. Some Fontainebleaus, small white grapes, arrived last week, and these were the first grapes received from California. Tuscan, Bernard and Amelia peaches are among the latest receipts, the latter being a large white-fleshed variety, valued for drying. Large yellow peaches, like Early Crawford and St. John, from Maryland and Delaware, have sold as high as $2.50, wholesale, while the best baskets of Troth and Mt. Rose have only brought $1.50. Among plums not noticed before are the Hungarian prune, the true name of which is English Pond's Seedling, a very showy fruit of a reddish violet color, with a handsome bloom; Glaister, not unlike the Yellow Egg plum; Burbank's Satsuma, a round deep red fruit, and the Diamond, Walling, Bulgarian, Gross and Magnum Bonum plums. Royal Anne and Black Republican cherries continue to arrive, and in the seventy car-loads of California fruit sold here last week were large Howell pears, and the Souvenir du Congres, a bright yellow pear with brilliant red coloring, suggesting the Bartlett in this respect, though it lacks the high flavor of this favorite. Alexander apples, from California, a very large greenish yellow fruit, sell for $1.75, retail, for a box containing five dozen apples. The best apples from New Jersey and the Hudson River district are the Orange Pippin, Nyack Pippin and choice Astrachan, which are worth $2.50 a barrel at retail. The Cuban pineapple season is ended and the Florida season for this fruit is drawing to a close. Some large garden-grown pineapples from Florida, known as the Cayenne variety, with showy luxuriant tops, sell as high as six dollars a dozen at wholesale. North Carolina is sending Ives, Concord and Moore's Early grapes, and large quantities of the red-fleshed Christina muskmelon come from Norfolk and from New Jersey. Notwithstanding the smaller supply of vegetables, on account of the drought, prices are about one-fifth lower than they were a year ago. Sweet-potatoes, for example, sold then for $3 to $4 a barrel, while $2.50 is the highest price paid at this time.